

## Programme Specification

### MEng Architectural Engineering

For students entering Part 1 in September 2024

UCAS Code: K260

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**This document sets out key information about your Programme and forms part of your Terms and Conditions with the University of Reading.**

Awarding Institution	University of Reading
Teaching Institution	University of Reading
Length of Programme	4 years
Length of Programme with placement/year abroad	MEng Architectural Engineering with Year in Industry - 5 years (internal transfer only)
Accreditation	Accreditation is to be sought from the Chartered Institution of Building Services Engineers (CIBSE) and Energy Institute (EI).
QAA Subject Benchmarking Group	Engineering

### Programme information and content

The programme aims to provide you with a thorough Integrated Master's degree level education in Architectural engineering, enabling you to deliver engineering solutions to solve problems in the built Environment.

Based on a grounding in the fundamental principles of engineering, architectural concepts and relevant aspects of the built environment at both building and urban levels, the programme covers the design, management and operation of resource-efficient buildings within the urban context. Major areas covered include design and management of building environmental systems and urban energy systems, structural analysis, building pathology, construction site engineering, architectural design, and digital technologies with a focus on numerical modelling and programming.

The programme will prepare students for subsequent PhD studies or for pursuing a career in the built environment industry by providing:

- Practical, experimental and laboratory-based engineering experience in the design and management of buildings within the broader context of urban environment;
- Problem-solving skills;
- Underpinning skills in mathematics, programming and relevant science and technology;
- Knowledge of the state-of-the-art in building and environmental systems as applied in the design and management of the built environment;
- Understanding of ethics and health and safety issues associated with the design, construction and management of the built environment;
- The ability to work in an academic, industrial or research environment as individuals or as part of a team;

	<ul style="list-style-type: none"> <li>• The ability to plan, manage and conduct an in-depth individual project in architectural engineering.</li> <li>• Critical awareness of current problems and new insights at the forefront of architectural engineering;</li> <li>• Originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the field of architectural engineering.</li> <li>• Conceptual understanding that will enable you to evaluate critically current research and advanced scholarship, to evaluate methodologies and develop critiques of them, and to propose new hypotheses.</li> </ul>
Part 1:	Introduces the fundamental underpinning principles and techniques in architecture, science and engineering needed for a career in architectural engineering.
Part 2:	Provides knowledge and understanding in more advanced areas of architectural engineering, building upon the fundamentals learned in Part 1. Part 2 provides students with the opportunity to work in teams to design and develop an engineering solution for a real-world engineering need in the built environment.
Placement/Study abroad year:	The MEng Architectural Engineering includes an optional year-long industrial placement/study abroad. Many students find that the experience and knowledge gained during the industrial placement/study abroad allow them to make better use of their final year of University study and provide useful background knowledge for more permanent career choices.
Part 3:	Part 3 allows you to specialise in the areas of Architectural Engineering that interest you the most. You will gain experience in planning, managing and conducting an in-depth research project in Architectural Engineering.
Part 4:	Part 4 of the MEng programme has a strong research focus. You will conduct a substantial individual research project of relevance to current research in the school. Modules will provide you with knowledge and understanding of topics at the cutting edge of Architectural Engineering, energy and environment research.

**Programme Learning Outcomes - MEng Architectural Engineering**

During the course of the Programme, you will have the opportunity to develop a range of skills, knowledge and attributes (known as learning outcomes) For this programme, these are:

<b>Learning outcomes</b>	
1	Demonstrate detailed knowledge and critical understanding of concepts, principles, and theories relevant to Architectural Engineering.
2	Use the knowledge and understanding, developed through the course of study and personal investigations as an individual and as part of a team as well as engineering principles, analytical methods, modelling techniques, qualitative and quantitative

	methods, and appropriate computational tools and packages to respond systematically to engineering challenges in the built environment.
3	Combine the knowledge and understanding of underpinning scientific principles, mathematical methods, and engineering practice to analyse engineering problems in Architectural Engineering and formulate appropriate solutions.
4	Analyse and integrate information and data from a variety of sources and critically evaluate the appropriateness of different approaches to solving a set of defined engineering problems in the built environment.
5	Analyse and evaluate solutions to engineering challenges in energy and environmental systems using a range of scientific theories, engineering analysis, and evaluation skills, taking into account appropriate quality standards, codes of practice, and industry standards.
6	Demonstrate awareness of the possible conflicting demands of clients, stakeholders, and other design and construction bodies in the development of appropriate interdisciplinary and sustainable solutions in the design and management of the built environment.
7	Undertake engineering projects responsibly, professionally, and ethically, with regard to environmental risk considering the sustainability agenda in the built environment as well as the framework of relevant legal requirements.
8	Practice a range of transferable skills including problem-solving, communication, team working, IT skills, information management, planning self-learning, and reflection, all within the context of progression toward professional engineering status.
9	Draw on an understanding of the engineering principles in evaluating existing practices in Architectural Engineering, investigating new technologies, and dealing with unfamiliar situations professionally.
10	Apply techniques relative to the evaluation of energy efficiency and environmental impacts of buildings to contribute to achieving our net zero carbon future in the building sector.
11	Understanding of ethics, professional responsibilities, and health and safety issues associated with the design, and management of the built environment.
12	Appraise a range of renewable energy technologies and energy management approaches considering their energy and environmental performance.

You will be expected to engage in learning activities to achieve these Programme learning outcomes. Assessment of your modules will reflect these learning outcomes and test how far you have met the requirements for your degree.

To pass the Programme, you will be required to meet the progression or accreditation and award criteria set out below.

### **Module information**

Each part comprises 120 credits, allocated across a range of compulsory and optional modules as shown below. Compulsory modules are listed.

#### **Part 1 Modules:**

<b>Module</b>	<b>Name</b>	<b>Credits</b>	<b>Level</b>
CE1BSP	Building Services and Project	20	4
CE1CIC2	Information and Communication	20	4
CE1ENM	Engineering Mathematics	20	4
CE1ESE	Empirical Studies and Site Engineering	20	4
CE1HMS	History of the Built Environment, Material, and Structural Analysis	20	4
CE1PNM	Numerical Modelling and Programming	20	4

**Part 2 Modules:**

<b>Module</b>	<b>Name</b>	<b>Credits</b>	<b>Level</b>
CE2ARD	Architectural Design	20	5
CE2BPS	Building Pathology and Surveying Practice	20	5
CE2BSA	Building Services Fundamentals and Applications	20	5
CE2PNM	Numerical Modelling and Project	20	5
CE2STA	Statistical Analysis	20	5
CE2THF	Thermodynamics, Heat Transfer and Fluids Mechanics	20	5

**Modules during a placement year or study year (if applicable):**

<b>Module</b>	<b>Name</b>	<b>Credits</b>	<b>Level</b>
CE3YIN	Construction Year in Industry	120	6

If you take a year-long placement or study abroad, Part 3 as described below may be subject to variation.

**Part 3 Modules:**

<b>Module</b>	<b>Name</b>	<b>Credits</b>	<b>Level</b>
CE3DCT	Digital Technology use in Construction	20	6
CE3HVD	Heating Ventilation and Air Conditioning Design	20	6
CE3PDR	Design Project For MEng	40	6
CE3SBE	Sustainable Built Environments	20	6

The remaining credits will be made up of optional modules available in the School of the Built Environment.

**Part 4 modules:**

<b>Module</b>	<b>Name</b>	<b>Credits</b>	<b>Level</b>
CEM10A	Research skills	20	M
CEM10B	Research dissertation	40	M
CEM370	Urban Microclimates and ICT and Energy Management	20	M
CEM410	Renewable Energy	20	M

The remaining credits will be made up of optional modules available in the School of the Built Environment.

## **Placement opportunities**

### **Placements:**

You may be provided with the opportunity to undertake a credit-bearing placement as part of your Programme. This will form all or part of an optional module. You will be required to find and secure a placement opportunity, with the support of the University.

### **Study Abroad:**

You may be provided with the opportunity to undertake a Study Abroad placement during your Programme. This is subject to you meeting academic conditions detailed in the Programme Handbook, including obtaining the relevant permissions from your School, and the availability of a suitable Study Abroad placement. If you undertake a Study Abroad placement, further arrangements will be discussed and agreed with you.

## **Optional modules:**

The optional modules available can vary from year to year. An indicative list of the range of optional modules for your programme can be found online in the Course Catalogue. Details of optional modules for each part, including any additional costs associated with the optional modules, will be made available to you prior to the beginning of the Part in which they are to be taken and you will be given an opportunity to express interest in the optional modules that you would like to take. Entry to optional modules will be at the discretion of the University and subject to availability and may be subject to pre-requisites, such as completion of another module. Although the University tries to ensure you are able to take the optional modules in which you have expressed interest this cannot be guaranteed.

## **Teaching and learning delivery:**

You will be taught primarily through a mixture of lectures, tutorials and seminars, depending on the modules you choose. Some modules may include group work. Elements of your programme will be delivered via digital technology. The scheduled teaching and learning activity hours and amount of technology enhanced learning activity for your programme will depend upon your module combination. In addition, you will undertake some self-scheduled teaching and learning activities, designed by and/or involving staff, which give some flexibility for you to choose when to complete them. You will also be expected to undertake guided independent study. Information about module study hours including contact hours and the amount of independent study which a student is normally expected to undertake for a module is indicated in the relevant module description.

A mixture of the following teaching and learning methods are used to achieve the programme learning outcomes. The proportions vary depending upon the specific modules. For the student, the proportion will also be determined by the pathway and options chosen.

### **Lectures and tutorials**

Formal lectures are typically one to two hours in length. Academic staff and guest lecturers deliver subject content in creative and innovative ways to achieve active participation by the learner students. Substantive problems are illustrated in lectures and discussed in smaller tutorial groups for selected modules. The students are expected to undertake independent self-directed study to extend and deepen their understanding.

### **Project work**

In all years of the programme, students undertake project-based activities integrated in various modules. Students are provided with real-life and simulated scenarios and practical exercises which apply the theory and concepts that they learn from the programme.

These project-based activities involve substantial amounts of group work and help build both technical and interpersonal skills. They often use enquiry-based learning techniques which help deepen students' understanding and also help them develop problem-solving skills. Peer assessment is an important element of this group work.

### **Field trips / industry visits**

Throughout the three years of the programme, students have opportunity to go on field trips, site and industry visits. This is part of our industry-orientated approach that underpins our programme. Field trips are organised by the programme director, module convenors or the career development advisor. Career events are organised on-campus where small, medium and large consultancies and construction organisations talk to students, display their placement offerings and job opportunities for all year groups.

### **Online learning**

We use the University of Reading's Virtual Learning Environment (Blackboard) to give students all their module and programme materials. This online tool is also used for classwork, questions and answer forums and other related work. We also use Teams for online classes and meetings with students. Students' assignments are submitted and graded via Turnitin or Blackboard and feedback is also given online. We use some subject specific e-learning, such as the teaching of Revit for production of drawings and simulation packages for building modelling and assessment of relevant performance indicators.

### **Accreditation details**

Accreditation is to be sought from the Chartered Institution of Building Services Engineers (CIBSE) and Energy Institute (EI). If accreditation of this programme is approved, graduates from this programme may, after a period of professional experience, together with other appropriate educational requirements, apply for Chartered Engineer status.

### **Assessment**

The programme will be assessed using a range of assessment methods including written examinations, coursework, in-class tests, reports, and oral examinations. Further information is contained in the individual module descriptions.

## **Progression**

### *Part 1*

To achieve a threshold performance at Part 1, a student will normally be required to:

- (i) Obtain an overall average of 40% over 120 credits taken in Part 1;
- (ii) Obtain a mark of at least 40% in individual modules amounting to not less than 80 credits taken in Part 1; and
- (iii) Obtain marks of at least 30% in modules amounting to 120 credits.

In order to progress from Part 1 to Part 2, a student must achieve a threshold performance;

The achievement of a threshold performance at Part 1 qualifies a student for a Certificate of Higher Education if they leave the University before completing the subsequent Part.

### Transferring from a Joint Honours to a Single Honours programme

Students are able to transfer from a Joint Honours to a Single Honours programme in one of their joint subject areas at the end of Part 1, subject to fulfilling the Part 1 University Threshold Standard, achieving marks of at least 40% in at least 40 credits of modules in the subject to which they wish to transfer, and fulfilling any programme-specific progression rules for the Part 1 Single Honours Programme to which they wish to transfer.

Students who transfer from a Joint Honours to a Single Honours programme may not have taken all of the Part 1 modules listed in the Single Honours Programme Specification. The modules which they have taken will be shown on their Diploma Supplement.

### *Part 2*

To achieve a threshold performance at Part 2, a student shall normally be required to:

- (i) Obtain a weighted average of 40% over 120 credits taken in Part 2; and
- (ii) Obtain marks of at least 40% in individual modules amounting to at least 80 credits taken in Part 2; and
- (iii) Obtain marks of at least 30% in individual modules amounting to at least 120 credits, except that a mark below 30% may be condoned in no more than 20 credits of modules owned by the Department of Mathematics and Statistics.

In order to progress from Part 2 to Part 3, a student must achieve a threshold performance;

The achievement of a threshold performance at Part 2 qualifies a student for a Diploma of Higher Education if they leave the University before completing the subsequent Part.

### *Professional/placement year*

Students are required to pass the professional placement year/study abroad year in order to progress on the programme which incorporates the professional placement year/study

abroad year. Students who fail the professional placement year/study abroad year transfer to the non-placement year version of the programme.

### *Part 3*

In order to progress from Part 3 to Part 4, a student must achieve an average of 40% over 120 credits taken in Part 3, and

- (i) a mark of at least 40% in individual modules amounting to not less than 100 credits taken in Part 3; and
- (ii) a mark of at least 30% in individual modules amounting to not less than 120 credits taken in Part 3; and.
- (iii) a mark of at least 40% in the Part 3 major project module (Design Project for MEng, CE3PDR).

Students who do not meet the above requirements for progression to Part 4 may be eligible for the award of BEng considering the award classification for BEng in Architectural Engineering.

### **Classification**

Bachelors' degrees

The University's honours classification scheme is based on the following:

Mark Interpretation

70% - 100% First class

60% - 69% Upper Second class

50% - 59% Lower Second class

40% - 49% Third class

35% - 39% Below Honours Standard

0% - 34% Fail

The weighting of the Parts/Years in the calculation of the degree classification is:

*Four year Integrated Masters Programmes (MEng, MMath, MChem etc.)*

Part 2: 20%

Part 3: 40%

Part 4: 40%

*Five year Integrated Masters Programmes including Placement year/Study abroad (MEng, MMath, MChem etc.)*

Part 2: 20%

Placement year/Study abroad: Year abroad not included in the classification

Part 3: 40%

Part 4: 40%

The classification method is given in detail in [Section 18](#) of the Assessment Handbook.

### **Additional costs of the programme**

Students enrolled in this programme are required to purchase a drawing board. It may cost approximately £100.

Costs are indicative and may vary according to optional modules chosen and are subject to inflation and other price fluctuations. Estimates were calculated in 2023.

**For further information about your Programme please refer to the Programme Handbook and the relevant module descriptions, which are available at <http://www.reading.ac.uk/module/>. The Programme Handbook and the relevant module descriptions do not form part of your Terms and Conditions with the University of Reading.**

MEng Architectural Engineering for students entering Part 1 in session 2024/25

18 July 2023

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